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PEZIZA PROTEANA VAR. SPARASSOIDES IN AMERICA

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(WITH PLATE 1)

Peziza proteana was described by Boudier,[1] in 1899, from material collected in the forêt de Carnelle, near Paris. In 1917, Seaver[2] published a photograph and description of the species, stating that it had appeared several times in the vicinity of New York City, and citing Texas, also, as within its range of distribution. Two collections of *P. proteana* were made at Ithaca, N. Y., by E. J. Petry, in 1907 and 1909, both of which were studied in the fresh condition by the writer. The plants were growing in late autumn, on burnt soil around the bases of trees, on the wooded, swampy flats at the head of Cayuga Lake. The collection made in 1907 (Herb. Durand, no. 5251) consisted of three separate ascomata, about 5 cm. in diameter, bowl-shaped and somewhat inequilateral, and of one group made up of several cups coalesced into a large, irregular *Gyromitra*-like mass. The specimens were all growing together, and microscopical examination disclosed no differences in either excipular structure or hymenial characters. The compound mass gave every appearance of being an extreme development of the condition seen so often among the fleshy Pezizas when growing closely crowded together. In *P. badia* and *P. vesiculosa,* for example, the writer has seen large numbers of crowded ascomata not only cohering closely, but the tissues of adjoining cups so completely grown

[1] Bull. Soc. Myc. Fr. **15**: 50. *pl. 3. f. 1.* 1899.

[2] Mycologia, **9**: 1–3. *pl. 1.* 1917.

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together that they could not be separated, and it was difficult to make out in sections where one ended and the other began. In Petry's 1909 collection (Herb. Durand, no. 6932) the numerous cups were densely cespitose and more or less coherent.

On October 27, 1909, Professor G. F. Atkinson collected beautiful specimens of the compound form, on burnt soil about the bases of dead elm trees, on the same Cayuga Flats. The masses were much larger, more intricate, and in every way more highly developed and complex than the one gathered by Petry. A very noticeable feature was the extreme brittleness of the flesh, the masses falling to pieces almost at a touch. These specimens were examined by the writer and found to agree excellently with Boudier's description and figures of *Galactinia proteana* var. *sparassoides* Boud.[3] Professor Atkinson has recently very kindly placed in my hands notes and photographs made by him from the fresh plants, with the suggestion that they be published. His notes are as follows:

"Plants sessile without any stem above or in the ground. One plant 25 cm. broad, rather old and somewhat collapsed, probably about 15 cm. high. Fresh plants smaller, more or less oval or elliptical in general outline, 10–12 cm. high by 7–9 cm. broad. At first lilac in color and the younger parts lilac, older parts becoming whitish to creamy white, very fleshy, entirely made up of convoluted branches and anastomosing, lamellar structure. The large cells or caverns .5–2 cm. in diameter, irregular, extending from the base through all parts of the plants, thus sometimes having a more or less radiate structure. Hymenium on both surfaces of the walls. The soil at the base is sometimes quite rich in mycelium. As this comes to the surface the fruit body begins to develop, forming an irregular, expanded, and folded structure which is whitish or lilac in color, bearing the hymenium. The extension of these folds and caverns produces the large fruit body. Asci cylindrical, 200–226 × 10–12 μ. Spores uniseriate in the upper third of the ascus, elliptical, roughened, hyaline, biguttulate, 10–12 × 5–6 μ."

It should be added that the asci become intensely blue with iodine, and the excipulum consists of two layers of large, vesiculose cells, 30–60 μ in diameter, separated by a median layer of stout hyphae.

[3] Bull. Soc. Myc. Fr. **15**: 51. *pl. 3. f. 2.* 1899.

In his most recent work Boudier speaks of this plant, as follows:[4] "This curious production, which I can regard only as a luxuriant state of *Galactinia proteana* has all its anatomical characters save the margin and external form; it is to my mind an hypertrophied state of this species, excessively analogous to that which one finds in *Disciotis venosa, reticulata* and *Aleuria vesiculosa* var. *saccata*. It is remarkable for its fragility and appears more frequently than the type."

In this connection reference should be made to a plant collected by Polley, at Belton, Lake McDonald, Mont., in 1903, and described by Miss Hone[5] under the name *Gyromitra Phillipsii* Mass. Miss Hone's notes indicate a plant very similar to *P. proteana* var. *sparassoides*, and examination of alcoholic material kindly sent to the writer by Miss Hone proves that it is identical with the one collected at Ithaca.

One is thus led immediately to inquire whether Boudier's *G. proteana* var. *sparassoides* may not be the same as Massee's *Gyromitra Phillipsii*. A careful study of Phillips's description and figures[6] of the plant which he regarded as the true *Gyromitra gigas* Kromb., and of Massee's description[7] has convinced the writer that the two plants are identical without question. However, only a study of authentic specimens, which are not available to the writer, can settle the matter definitely.

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[4] Icon. Myc. **4**: 162. 1911.
[5] Postelsia, **1906**: 237–244. 1906.
[6] Journ. Bot. **31**: 129. *pl. 334*. 1893.
[7] Brit. Fung.-Flora **4**: 478. 1895.

NEW OR NOTEWORTHY PORTO RICAN FUNGI

F. L. Stevens and Nora E. Dalbey

(With Plates 2 and 3)

The following forms were collected by the senior author in Porto Rico. Specimens are deposited as stated in an article by Esther Young.[1]

Septoriopsis gen. nov.

Spores long-filamentous; conidiophores simple, borne on a tubercular base. Distinguished from related genera as is indicated in the adjacent key.

Type species, *Septoriopsis Chamaesyceae.*

Septoriopsis Chamaesyceae sp. nov.

Figs. 1, 2

Spots circular, definite, small, 1–4 mm. in diameter; centers pale to ashen; borders red. Sporodochia amphigenous, top-shaped, arising deep within the leaf tissue and erumpent, dark; about 45 μ broad at the top and of slightly greater height from base to top. Conidia like those of *Septoria,* about 35 μ long, 2 μ thick.

On *Chamaesyce hypericifolia,* Trujillo, *9438,* Rio Piedras, *9445* (type).

The Tuberculariaceae-Scolecosporiae in the first eighteen volumes of Saccardo's "Sylloge Fungorum" contain only the genus *Schizotrichum,* while volume *22* adds *Ranojevicia, Linodochium,* and *Volutellopsis.* The essential characters separating these genera are shown in the following key:

Sporodochium setose.	Schizotrichum.
Sporodochium with a ciliate margin.	Volutellopsis.
Sporodochium not setose or ciliate-margined.	
Conidiophores dichotomous.	Ranojevicia.
Conidiophores verticillate.	Linodochium.
Conidiophores simple.	Septoriopsis.

[1] Mycologia **7**: 143. 1915.

Septoriopsis Piperis sp. nov.

Figs. 3, 4

Spots irregular, definitely limited, 1–2 cm. in diameter, infected tissue dead, dirty-white, bordered by a thin purplish-brown line, closely set with spore clusters. Mycelium internal, fine; conidiophores in clusters of large numbers, of same diameter as spores, aggregated into a sporodochium 45–60 μ in diameter, about 90 μ high. Conidia long, narrow, 68–165 $\times$ 3–4 μ, many-septate, obtuse, pale.

On *Piper medium*, San German, *5792* (type).

This fungus is especially interesting, since it is close to both the Melanconiales and the Moniliales. The conidiophore clusters are so large, dense, and short that the group on mere superficial examination might readily be regarded as an acervulus or even as a pycnidium but might equally be regarded as a group of conidial hyphae. The true relation is clearly shown only by microtome section. The young tubercles are often solid, nearly spherical masses which develop subepidermally and later become erumpent. When of this form they superficially and even in section look much like *Septoria*.

EXOSPORIUM Link

Exosporium Leucaenae sp. nov.

Figs. 5, 6, 7

Spots 2–4 mm. in diameter, circular, tawny, rather closely covered by sporodochia. Sporodochia hypophyllous, 110–240 μ in diameter, 30–40 μ high, exclusive of the spores, almost or quite flat-topped. Conidiophores barely tawny, much lighter in color than the spores, simple or branched toward the tip, thick, obtuse. Conidia clavate, brown, three or more septate, 58 $\times$ 8 μ obtuse, often tapering to one end.

On *Leucaena glauca*, Arecibo, *6792* (type), Vega Baja, *4295*, Manati, *5265*, Quebradillas, *5122*, Aguada, *5076*. The fungus would fall in the genus *Helminthosporium* but for the sporodochial character. The condiophores are, however, closely compacted into a true tubercular structure which, except for height, might be regarded as a coremium. To the naked eye the sporodochia look much like the sori of a rust.

RAMULARIA Unger

Ramularia Mimosae sp. nov.

Fig. 8

Conidiophores amphigenous, more abundant above. Spots indefinite, the whole affected leaf portion covered with a conspicuous whitish coating of the conidia and conidiophores. Condiophores in clusters of from ten to thirty + from the stomata, hyaline, short, about $17 \times 4\,\mu$, unbranched, continuous. Conidia hyaline, $24–37 \times 3.5\,\mu$, several-septate, straight or crooked, tapering to each end, obtuse.

On *Mimosa pudica,* Coamo Springs, *8367* (type), Penuelas, *7215*, Arecibo-Lares road, *7298*, Mayaguez, *7110*, Lajas, *7158*. This fungus is very common in Porto Rico and to the naked eye has all the appearance of an Oidium. It is quite distinct from *Cercosporella Mimosae* Sacc.

HAPLOGRAPHIUM B. & Br.

Haplographium portoricense sp. nov.

Fig. 9

Fungus superficial, forming diffuse, sooty spots on the leaf surface, epiphyllous or hypophyllous. Mycelium fine, $1.5 — 1.7\,\mu$, pale-yellow, forming a loose network over the leaf. Conidiphores arising directly from the mycelium, black, usually in small, 3–10, clusters, about $170\,\mu$ high, $7\,\mu$ thick, straight, rigid, septate, pale at tip, sometimes with few lateral branches. Apex branching as in *Penicillium*. Conidia ovoid, continuous, dark-colored, $17–20 \times 7–10\,\mu$.

On *Canna,* El Gigante, *8495* (type), *Canna coccinea,* Aibonite, *8447*.

The fungus appears to be strictly superficial and in general appearance is a sooty mold. The mycelium where it aggregates and gives rise to a cluster of conidiophores is much darker than the ordinary vegetative mycelium but is no greater in diameter. The conidiophores, however, are much thicker, about three times as thick as the mycelium.

The description is drawn from epiphyllous material. When hypophyllous, marked variations occur, such that were the speci-

mens examined independently they might not be placed in even the same genus. Here the typical *Penicillium*-like branching is rare, the conidiophores are longer (340 μ) and more attenuate, more lax, and typically show lateral sporiferous branches.

MICROCLAVA Stev.

Microclava Coccolobiae sp. nov.

Fig. 10

Mycelium internal, pale to brown. Conidiophores simple, about 70 μ high, 3 μ thick at base; stipe usually unicellular, upper part broadening gradually to 8 μ in thickness, and consisting of three superimposed cells.

On *Coccoloba diversifolia*, Maricoa, *8877* (type).

Wageria gen. nov.

Mycelium dark, superficial, with hyphopodia. Perithecium spherical, not ostiolate. Both typically perisporiaceous. Asci 8-spored. Spores dark, 2-celled. Perithecium with one or few vermiform appendages.

Type species, *W. portoricensis.*

The genus is named in honor of Dr. Harold Wager, of England. It differs from *Dimerium* Sacc. and Syd. in the possession of the vermiform appendage. It differs from *Phaeodimeriella* Th. and *Acanthostigma* in the absence of true setae.

Wageria portoricensis sp. nov.

Figs. 11, 12

Mycelium pale-brown, superficial, branching irregularly, 4 μ thick. Hyphopodia numerous, averaging about 35 μ apart, irregularly located, not opposite, nor regularly alternate, when young nearly spherical, soon becoming quite irregular in outline, usual diameter about 7 μ, occasionally exceeding 10 μ, usually with a central clear spot probably indicating attachment. Perithecia spherical, non-ostiolate, small, 47–55 μ in diameter, with few asci which mature successively, not simultaneously. Perithecia with 1–3, usually 1, coiled, vermiform appendages, dark, 40–80 × 7 μ. Asci irregular in shape, 8-spored, inordinate. Spores 2-celled, obtuse, dark, 21 × 6–7 μ.

On *Gonzalagunia spicata.* Jajome Alto, *8407* (type), El Alto de la Banderas, *7636.*

The characteristic appendages remind one strongly of the so-called chitinous appendages on certain Meliolas, *e. g., M. puiggarii.* They differ decidedly from true setae. In most cases there is only one on a perithecium, rarely so many as three. The perithecial wall is translucent and through it may be recognized the asci and even the spores and their septation. There is only one mature ascus but by crushing the perithecium the presence of other asci in earlier stages of development may be shown.

Mycosphaerella subastoma sp. nov.

Figs. 13, 14, 15

Spots brown, long, narrow when young, 1–2 mm. wide, 3–4 mm. long, limited laterally by veins; later by coalescence and spreading involving whole leaf segments. Perithecia 125 μ in diameter, solitary or grouped in large clusters of 2–40, dark-brown to black, globose, subepidermal, with a short beak reaching into the stomata; ostiole subastomal, definite, 20–30 μ in diameter. Asci 8-spored, 47 $\times$ 20 μ, apex strongly thickened. Spores long, narrow, 22–24 $\times$ 4 μ, hyaline.

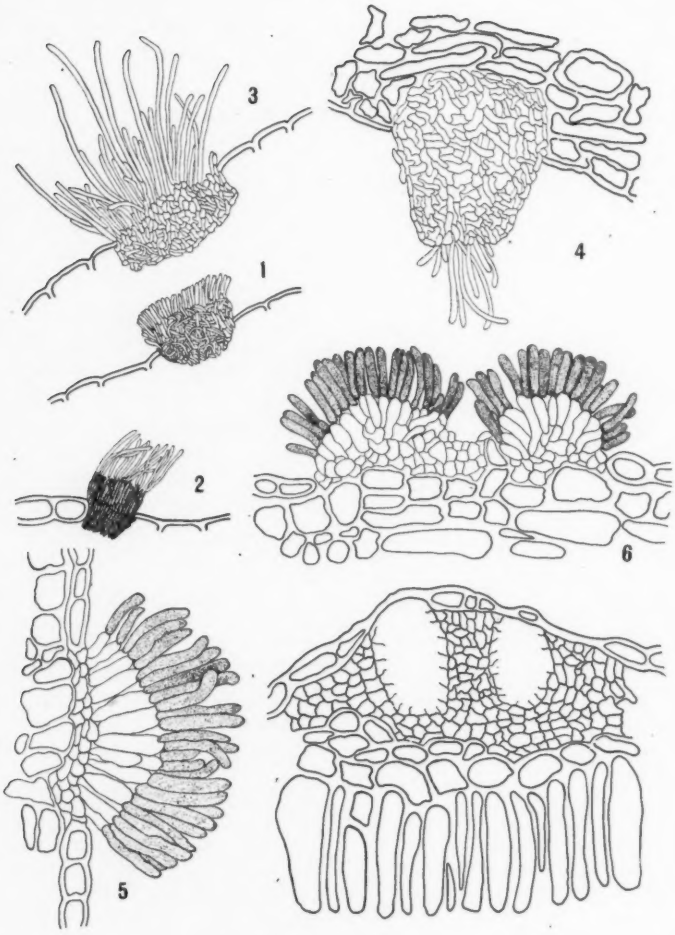
On *Aneimia adiantifolia.* Dos. Bocas., *8058* (type).

The three striking characters of this species are: the location of the ostioles directly under the stomata, the grouping of the perithecia, and the limitation of the fungus by the veins. The fungus develops strictly subepidermally and even at maturity does not become erumpent, liberating the spores by way of the stomata. The fungus differs markedly in essential characters from the several species previously described on ferns.

MYCOSPHAERELLA TYROLENSIS (Auer.) Lind.

Sphaerella tyrolensis Auer. on *Gymnogramme calomelanos* Barros, 140

Very numerous, small, 1–3 mm., tan-colored spots are produced on the host and these spots are thickly studded with the minute perithecia. Numerous "Sphaerellas" are recorded on the Pteridophytes, but all disagree with the specimens under dis-



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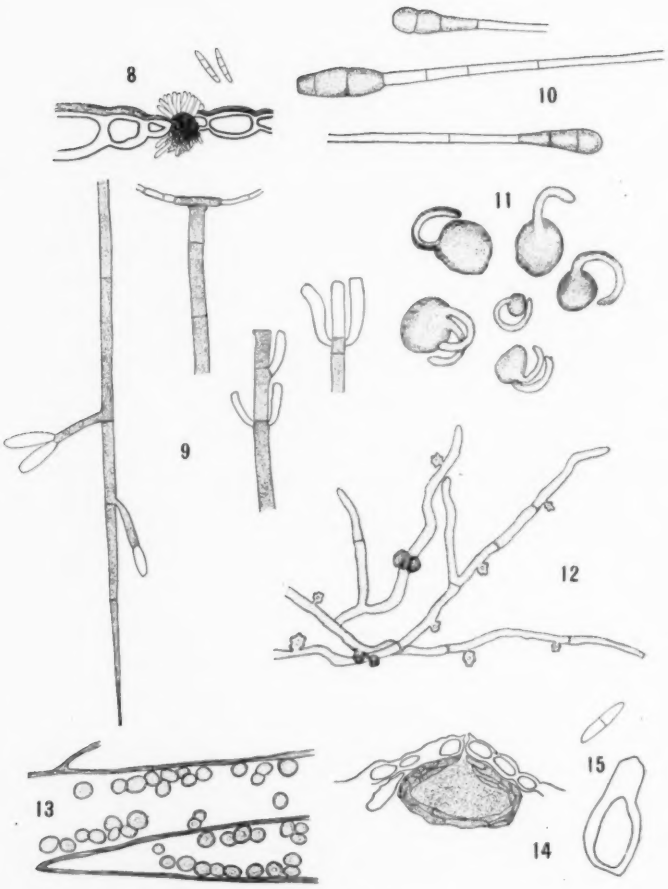

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cussion as to spore size and shape except the one above named. With this one, agreement is quite satisfactory with exception of perithecium size, which in the Porto Rican material is very uniform and considerably below the dimensions given for *M. tyrolensis*.

STEPHANOMA Wallr.

Stephanoma Melioliae sp. nov.

Mycelium hyaline, fine, 0.5–1 μ, crooked, abundant, overgrowing the *Meliola* and the adjacent leaf surface with a close network. Conidiophores arising directly from the mycelium, solitary or in groups, simple, erect, 17–27 $\times$ 3 μ, often curved at the tip. Conidia of two types: (1) spherical, 5 μ in diameter, hyaline, 1-celled, with usually eight straight, stiff spines about 3–4 μ long; (2) small, oblong, 6 $\times$ 3 μ, obtuse, continuous, hyaline.

On *Meliola tortuosa* Wint. on *Piper umbellatum* Lares, *4843* (type).

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EXPLANATION OF PLATES

PLATE 2

Figs. 1, 2. *Septoriopsis Chamaesyceae, 9445* (type). Sporodochia.

Figs. 3, 4. *Septoriopsis Piperis, 5792* (type). Sporodochia and spores.

Figs. 5, 6. *Exosporium Leucaenae, 6792* (type). Sporodochia and spores.

Fig. 7. *Exosporium Leucaenae* showing subepidermal development of the sporodochia.

PLATE 3

Fig. 8. *Ramularia Mimosae, 8367* (type). A cluster of conidiophores and conidia.

Fig. 9. *Haplographium portoricense, 8495* (type). (*a*) Condiophores showing the Penicillium-like branching. (*b*) Showing origin of conidiophore from mycelium, the mycelium being very fine and colorless and the conidiophore thick and dark. (*c*) Conidia from colony on the lower side of the leaf showing different form, mode of branching and size.

Fig. 10. *Microclava Coccolobiae, 8877* (type). Conidiophores and conidia.

Fig. 11. *Wageria portoricensis.* Perithecia with coiled, vermiform appendages, *8407* (type).

Fig. 12. *Wageria portoricensis.* Mycelium and hypopodia, *8407* (type).

Fig. 13. *Mycosphaerella subastoma.* Grouping of perithecia and limitation by veins, *8058* (type).

Fig. 14. *Mycosphaerella subastoma.* Showing perithecium is subastomal.

Fig. 15. *Mycosphaerella subastoma.* An ascus and spore.

NOTES ON CALIFORNIA FUNGI

H. E. Parks

The last two seasons, so far as weather conditions are concerned, have been anything but ideal. A long-continued drought was the direct cause of failure to secure many species that ordinarily are very plentiful. Again, the scattered storms have induced growth among some species over a most unusual length of time.

To one who is familiar with climactic conditions it would readily be seen that a long season with the fungi is hardly to be expected. Especially is this true when it is known that the dry season is very long, and never broken by summer showers such as are known in the eastern and northern states. Yet, under these dry conditions, one may be able to find many rare specimens of hypogaeous fungi as well as species of Hymenomycetales.

The active work in this investigation was begun in the fall of 1916, and has been continued steadily ever since, including constant observation of the districts to be worked, throughout the entire dry, dormant summer season. The work itself was planned, so far as possible for one man, to include a thorough search over definite regions, and to collect systematically all species found. Thus it was hoped to establish the complete range of species and also the duration of seasons. Special attention was to be devoted to certain classes, such as the Boletes, to solve the really complex problem of their relationship to eastern and European species; to really find out what species are found in this state.

Again, the Hymenogastrales and Tuberales, especially the latter, were to receive a most thorough investigation.

The results considered in this article were obtained only by persistent work under adverse and trying conditions. The amount of time devoted to exploring has been limited to one day in ten this last season, often after having worked all night, and in the face of winter storms. I have ridden over one thousand

miles on a bicycle, carrying a pack and a small rake. I have been taken for a game poacher and a fish shooter, and in one place was persistently hunted as a spy.

Notes and records are made with all material taken. Copies of the notes accompany the specimens, which are all sent to the Department of Botany at Berkeley, California, and there finally classified and preserved in the herbarium or dispatched to various specialists.

To say the least, the work is both arduous and intensely interesting. One who would engage in such a survey must be prepared to encounter and overcome many difficult situations. It is not all rambling over pretty meadows and fine wood-bordered roads. I have ridden many miles over the finest highways in the world, and also over miles of bad roads, railroad ties, and by-paths.

In the fall of 1916 we were favored with some very early rains that were sufficient to start the early fungi. It was, however, well into November before operations began. This first trip was made into the Santa Cruz Mountains, known to be very rich in Boletes. The trip was taken with the idea of a general survey of the district rather than any considerable amount of collecting. A cold snap set in, and the result was that very little material was visible in condition to be gathered. There was, however, evidence of an amazing variety of Agarics as well as several species of Boletes. A few specimens were taken, but nothing of special interest was noted except the enormous quantities of a large white *Tricholoma*. By way of extreme contrast, this same region, for the fall and winter of 1917–18, has been absolutely barren of this species. In fact, this season, there was not a hundredth part of the fungi seen in the previous year.

However, there was one discovery of considerable interest, and that was the finding of two individuals of an apparently new *Boletinus*. There are no descriptions to fit it, and constant watch is now kept for any recurrent plants. Nowhere else, search as I would, could I discover another specimen. Growing among dry, brown leaves, they are hard to distinguish, as the surface of the pileus is chocolate-colored and very deeply cracked or furrowed, and it measures some five to seven centimeters across.

Beneath, the tubes are very large, angular and dirty white; in fact, they are the largest in width of any species yet seen. The stipe is short, thick and lateral, with tubes decurrent. It is solid, tough and concolorous. When first seen the plant appears to be sessile, and altogether very unique.

Successive weekly trips were made to this location for some time, but no results were obtained until late in the spring after a long, cold winter, broken by one storm of exceptional duration and precipitation.

Late in March I visited the locality for the last time during the season, and within a few feet of the place where the *Boletinus* was taken, I found several specimens of *Gyromytra* which resemble *G. esculenta* very closely, but are apparently distinct. The fall of this year, upon one of my first visits, I was again surprised on the same spot with a single *Boletus* of large dimensions, and distinct from any species ever seen here. It was not in perfect condition, however, the large stipe being nearly severed by larvae.

The pileus was very conspicuous, being a brilliant red color, and covered with a dense jelly several millimeters in thickness. It was circular, broadly expanded, margin thick and even, with thick white flesh that turned slowly to a dirty-blue when broken. This flesh was not infested with larvae, the short yellow tubes but slightly so, and the stipe was almost totally destroyed. Like so many others, this last year, but a single plant was found. It is this search for the rare species that lends zest to the work and pleasure in the constant new discoveries resulting from intensive application to it. There is sport and excitement for the lover of outdoor life.

For some time during the winter of 1916–17, I made frequent trips to a region just about six miles south of San Jose, to what is known as the New Guadaloupe Mines. The topography of the country is interesting from many points of view. That particular portion which I was then interested in, and still have under observation, was a long, low ridge or two, very heavily wooded on the eastern slopes with a second growth of Coast Live Oak, *Quercus agrifolia*. It was the very nature of this growth that invited careful investigation. Many trips were made, and ex-

plorations extended all over this district, but with little results. I became very much discouraged at repeated failures here, as I had hope of securing some Tuberales and Boletes. Going over this ground was exceedingly hard work. I was led to return to this region mainly by noticing the work of the wood rats. And it was by watching the holes dug into hard ground, often a foot deep, that led finally to making some real discoveries.

This locality yielded me some very good specimens for instruction work; especially was this true of the common *Chanterelle*. This especially desirable fungus was absolutely unkown here until I exhibited some specimens from the coast, where it is very abundant. On this side of the mountains it is not very often found, and I hunted several seasons for it, finally securing specimens at Guadaloupe. Several fine species of *Clavaria* were also used for exhibition and instruction, as they were also unknown here.

I spent literally hours upon hands and knees in crawling through thickets and raking over the leafy deposits, and on one occasion I thus turned up a very peculiar specimen of *Thelephora* which was sent to Professor Burt for determination, as no description could be found to fit it. This is an instance where no definite location could be fixed that would be a guide to additional material; growing on the ground, covered with leaves and of itself inconspicuous.

On another day I came upon two specimens of *Amanita* growing close to the bole of a live-oak. They were exceptionally large, and symmetrical in proportion. Tinged with crimson, they seemed to fairly radiate with color. I turned them in as belonging to the *rubescens* group, but from what descriptions were available they seem a new and distinct species. This difference from published descriptions, or the entire lack of such descriptions, has been one of the strong incentives to the work now in hand.

Persistence had its reward, and on a trip to "The Call of the Wild" in the Santa Cruz Mountains I came upon a grove of pines in which a dense mat of débris had collected for years. I secured some good material of *Hydnangium carneum* on top of the ground, but under some six inches in this mat of needles. At the same time I secured specimens of a form that will certainly puzzle one when first found, for it has the appearance of a young *Co-*

prinus micaceus. The pileus is well developed, but the stipe appears to be undeveloped. Then, too, one sees the pseudolamellae and hardly knows what to expect until it is cut open.

Quite strangely, in reporting these specimens, I used almost the same words in describing them as did Dr. Setchell, who described and named this and another species as having been found at Berkeley in 1907; the one I found being somewhat common, the latter rare.

These two are species of the widely distributed, but uncommon genus, *Secotium,* about which there seems to be very little known. The species found as noted above is described by Dr. Setchell as *S. tenuipes,* and anyone having seen his paper cannot mistake this very remarkable fungus.

The other species named by him is even more remarkable, in its imitation of a young, red-capped species of *Russula,* and because of this resemblance it is known as *Elasmomyces russuloides.* It had up to this time proved to be quite rare, and was reported only from Berkeley, California.

During an extended trip to the coast, but only about twenty miles from the above location, late in May of 1917, I came upon a single specimen under a thin covering of laurel leaves. Seen from above, one would invariably take it for a *Russula* unless the description was known, and then only the conspicuous pseudolamellae would reveal its true character. It is a small plant, from two to five centimeters across the pileus, but very attractive.

When I resumed my explorations this spring in the original locality, I persistently encountered this last species, it proving to be quite abundant; so for a time I passed these forms by until some were needed for exhibition at the Wild Flower Fête. I had noticed an occasional form where the hymenium was entirely closed, but still a very definite stipe was present, and the color was almost pure white with no touch of the red. It now seems that I probably have a new form of *Elasmomyces,* as Dr. Setchell has announced very distinct characters for this new form, but more material should be at hand. However, this plant is neither of the two Secotiaceae previously described by him. Casual observation will often leave many fine specimens untouched because

of an external similarity. Another season should develop some definite knowledge of these peculiar forms.

A few days after my discovery of the *Secotium* at Alma, I went again to the Guadaloupe district, and secured after a great deal of hard work some specimens of a *Melanogaster* which so far seems well known and is quite common but as yet is unnamed. I have since collected it frequently and find it very interesting. It is a small, dark-brown or black growth, sometimes covered with a dense, brown, powdery substance that of itself would be a distinctive characteristic. I have found it averaging the bulk of a good-sized marble, and rarely up to the size of an egg and nearly round. It is most frequently found just under the leaves, but I have also discovered it over six inches deep in hard ground, and much wrinkled.

And there is still another strange thing about this fungus. Under coast live-oaks are favorite places for it, especially if the leafy deposit is heavy. Turning these leaves over, the little brown balls are exposed and are seen to be covered with great drops of moisture; and I have found them so day after day during many weeks, and in places where no rain had fallen for many months. As they mature, they become soft and in a way deliquesce. Really, the upper half falls away, exposing the interior, which has melted to a tarry consistency and then run away, carrying the ripe spores into the ground. When first exposed these little plants are often covered with a fine yellow mycelium, but no special point of attachment is seen and older plants do not show it.

It is common, but also very distinctive,—withal a plant not to be tolerated as a familiar companion unless thoroughly dried in the open air or securely pickled.

It seems that the Hymenogastrales are more or less to be associated with powerful aromatic properties, some of which are pleasant, but others powerfully offensive. And this particular *Melanogaster* is the most offensively pungent of them all. While maturing, if left in a room, it will be so strong in an hour's time as to be sickening. I do not wonder that botanists familiar with it find it difficult to select an appropriate name. Certainly, seeing it as I have, none of the offensive names fit; it would take them all and that would not be enough.

This plant is a favorite with the rodents—the wood rats search for it persistently. I have been able to detect it a long distance on a quiet day when the odor penetrates the woods while rats eat it. Proving this to a skeptic this last season afforded much amusement, and also added proof of its qualities. A visitor accompanied me on one occasion in May to this region, and in the woods I soon detected this odor and called attention to it. It was so strong that my friend noticed it, and was able to work down wind to its source under my direction until I pointed out the freshly turned ground and leaves. I induced him to dig among the leaves and he soon found the *Melanogaster*. It seemed almost unbelievable that such a small object could be so pungent.

On this latter occasion, I secured in the débris of a rat's nest a different species, larger, and covered with a very dense golden to reddish powder. Since then I have gathered two additional species, none with the evil odor. The different species are easily distinguishd by their reaction in alcohol, the former turning a deep eosin-red, and the others changing according to the color of their powder or spores.

Referring to these strong odors so characteristic of the Hymenogastraceae, I have found other genera very offensive when carried about in a collection, and this is true particularly with reference to species of *Hysterangium,* while *Rhizopogon* and *Gautieria* are also reported as very powerful. But some species are negative or mild; at least one *Gautieria* is very pleasant and others are bad only after being confined in a collecting case. Both the *Hysterangium* and the *Gautieria* are favorites of the wood rats, and the smell is easily identified at a long distance when the rats are feeding upon them.

Still in a persistent search for truffles, and loath to give up my location at Guadaloupe and seek other ground, I renewed my quest two days after finding the first *Melanogaster* in that vicinity. This took me into the very heart of a dense manzanita thicket, where progress was upon hands and knees. I shortly became involved so completely in the tangle that further progress was impossible. I came to a stop at a huge rat's nest built around an enormous manzanita, and had actually seen the occupants digging for some fungi around its very base. There was noticeable

a very pleasant woodsy odor that I later identified with the fungi they were eating. I found easily one fresh hole about twelve inches in depth in hard soil and could see at the bottom a half eaten fungus. This I secured and found that it was fully as large as an egg. The plant was not plentiful, but after much hard work I secured a total of seven, all deep in hard ground at the base of this nest. They proved to be a species of *Gautieria*. Two species are reported from this state by Dr. Harkness, but they seem to be very rare.

This species possesses an exceedingly powerful smell, which is rather pleasant and easily recognized. The specimens collected were in my possession for a short time, and although securely wrapped and boxed for shipment to Berkeley, they gave off so strong an odor that the house retained traces of it for several days. I have formed a theory of a certain relationship between these hypogaeous forms and the location of rat's nests, and I have so far seen it fairly well verified, for where the fungus is plentiful there the rats are also plentiful, or it may be the other way round.

Within a few days in this same locality, I made a deliberate test of this theory, and without much difficulty after getting a scent I went directly to a small nest in some poison oak and secured three very fine plants. Twice this season I tested the theory, and secured specimens at "The Call" without trouble. On another day when collecting had been very good, and I had overstayed my time at Guadaloupe, as I was making a very hasty departure, going through these same woods, I was attracted by what appeared to be a very fine, large puffball with a white peridium. I reported it as such and created considerable excitement, for it proved to be another *Gautieria* having a peridium at maturity.

These Gautierias have been examined by Professor Zeller, who pronounces them *G. morchellaeformis* and *G. Trabuti*.

March 31, 1917, proved to be a day full of excitement. Professor Setchell reported the day's collection as "amazing," and, when one considers the results obtained, it was most gratifying to me. It was on this day that I found the above *Gautieria* with a peridium. I was still at work on the Guadaloupe district, and had spent an entire morning in the thick woods without results.

At noon I decided to cross to the opposite hillside with its scattered oaks of very large size.

Under a single large tree on a very steep slope, I found a dense mass of leafy humus overlying fine, loose, dry soil. I found a few small *Pezizas* and was encouraged to look farther. When I finished it was nearly sundown and not a foot of soil under that tree had escaped search. On one side was the débris of a rat's nest. The first find of importance was a few small, brown tubers, at first referred to *Tuber candidum,* several specimens of *Genea arenaria, Hydnotrya ellipsospora, Hydnotryopsis Setchelli,* and some others. This was the first collection of truffles, and it now seems that the brown tuber is an unreported species—certainly not *Tuber candidum,* but I have not found it this season of 1918. Many specimens were found both here and at the other location, but very few contained mature spores. I also found them on the coast side of the mountains. *Genea arenaria* is fairly well known, and is well described by Dr. Gilkey in her Revision of the Tuberales of California. Of *Hydnotrya,* but a single specimen had been found in December, 1909, at Pacific Grove. During the season I added nearly a dozen plants to the collection. *Hydnotryopsis,* likewise, was known only by very scanty material, but Dr. Gilkey gave me personal assurance that material sent in that day was sufficient to confirm her description in every detail made from long preserved material in the Harkness collection.

On April 15 I secured another tuber which promises to be in a new genus close to *Piersonia,* according to Dr. Gilkey, but more material must be had if possible. In a good collection made the last of May and examined by Dr. Gilkey, there seems to be another genus which she says is intermediate between *Geopora* and *Hydnotryopsis,* but for the time being the specimens are referred to this latter genus.

I have made frequent reference to the wood rats and their nests, and it is well to explain that in many cases I have been well rewarded by operating around them. The rotten wood and decomposed material that settles around them seems to create ideal conditions for growth of hypogaeous fungi. When one considers the very large number of specimens taken in 1917, as well as the

wide range of species found in close proximity, others may, in searching for such forms, well pay close attention to such places.

How well I was repaid for this observation was shown on April 17, when I was again in the Guadaloupe district. I found some sixty odd specimens of Tuberales, including *Genea, Hydnotrya,* four species of *Tuber,* and some others not as yet identified as to species. The one remarkable feature of these tubers was that there were twenty-five of the brown ones found on March 31. It now began to appear that this was not *Tuber candidum.* I found it in many places during the next two months, and a large amount of material is on hand for the specialist to work over.

Tuber candidum was not found until late in May. The two species are very much alike in size, shape, and color, but my brown tuber is of a solid brown, easily distinguished from *T. candidum,* which has an almost pinkish cast. Both are slightly cracked in radiating lines, with solid, white meat, very sweet and nutty to the taste, but having no particular aroma.

Much additional material was added this season, but nothing like the quantities found last year, although the brown tuber has not been seen. Some very puzzling forms have been found, but not sufficient to be of much value. Two, however, are worth mentioning. One, a single specimen previously reported only from Placerville by Dr. Harkness; the other apparently a new form of *Hydnocystis,* since Dr. Setchell pronounces it not *H. Californica* and this is the only species referred to as Californian by Dr. Gilkey.

On April 15, 1917, I was making an effort to secure more *Gautiera* with a peridium, and toward the close of the day I had worked into the old tangle of manzanita, where I secured a large collection of a white fungus that seemed upon examination to be what I wanted. It proved, however, to be a species of *Hydnangium,* and new to Dr. Setchell. Whether or not it is a described species has not yet been determined.

Another genus not very well known has proved of exceptional interest this year, and this is *Hysterangium.* During the season of 1917 I came upon scattered plants of a single species, with a white peridium and a very tough, gristly interior. This is a verdigris-green-spored species with a most offensive smell. Once

seen, this plant is not easily forgotten. I encountered it quite unexpectedly this season and have been able to study it rather intimately. As the genus seems to be little known, I shall go into some details of its growth and appearance.

It is truly hypogaeous and a gross feeder upon the forest débris, and may be found in all kinds of forests. It prefers no one species of tree, and I have found it equally plentiful under redwoods and live oaks. As one gets into this work, it becomes possible to identify some of the genera by the appearance of the mycelium encountered before the spore-body has been seen. Hysterangium is the easiest to identify and is unmistakable.

This mycelium is white, coarse, and in dense mats often several inches thick and extending over many square feet. In fact, the extent of these mycelial beds is enormous. I have been able to gather sheets of it that looked like lace. The sporophores average at maturity 2.5–3 cm. in diameter, and are nearly round, with a thick, white peridium that turns brown when handled or exposed to the air. This peridium breaks easily and separates from the context. The interior is a tough, green, gristly substance in the center of which there appears to be a well-lined cavity.

I came upon a bed of mycelium in a redwood forest in January last, and followed it to its limits and roughly measured its extent at 500 square feet—I believe this was conservative. In fact, on almost any place within a quarter of a mile on that hillside, this species could be found. The young plants are in a network of this mycelium, but, as it reaches maturity, the threads disappear, leaving the plant near the surface, where it slowly decomposes. I never failed to find this species in quantities, and soon gave up collecting it.

Late in March I was close to this locality, but working along the edge of a grove of live oaks for tubers, when I encountered a bed of this mycelium, and directly I came upon several huge specimens—some as large as eggs. I had found an end of the bed and started to trace its extent. It was less than two feet in width, in gravelly soil, and about every four feet I came upon a cluster of closely crowded, distorted, huge plants. Shortly it entered dense brush, and the spore-bodies no longer appeared. I was able to trace this narrow bed for over two hundred feet, and

then quit in a dense thicket. It never varied from its straight course. The tubers were green-spored but not offensive; the peridium separated more readily, and the central cavity was not present. Radiating from the base were streaks of a gristly substance different in color from the context.

Subsequently, I encountered another extensive bed of a huge species, but the context was purplish at first, later turning to a raw-beef color with streaks of gristle in it. And, still later, I found another of the green-spored species, which was very small. All the others had the white peridium usually separating readily, but in this last species the peridium proved to be very tough. There is considerable material on hand for study, but more is desired and will be sought this coming season.

1234 DELMAS AVENUE,
SAN JOSE, CALIFORNIA.

CUBAN POLYPORES AND AGARICS

WILLIAM A. MURRILL

POLYPORACEAE

Hymenophore entirely resupinate, never reflexed. — Tribe 1. PORIEAE.
Hymenophore normally pileate, often effused-reflexed, sometimes varying to resupinate.
  Hymenium porose.
    Hymenophore annual. — Tribe 2. POLYPOREAE.
    Hymenophore perennial. — Tribe 3. FOMITEAE.
  Hymenium furrowed. — Tribe 4. DAEDELEAE.

Tribe 1. PORIEAE

a. White or bright-colored species

POLYPORUS (RESUPINATI)
- CARNEOPALLENS Berk. Dead wood.
- EXCURRENS Berk. & Curt. Under side of old logs.
- RIVULOSUS Berk. & Curt. Dead polypores.
- VAPORARIUS Fries. Dead wood.
- VINCTUS Berk. Dead wood.
- VULGARIS Fries. Dead wood.
- XANTHOLOMA Schw. Dead wood.

PORIA
- PHLEBIAEFORMIS Berk. Rotten wood.

b. Brown or dark-colored species

FOMITIPORELLA
- ALTOCEDRONENSIS Murrill. Dead trunk in a forest.

FOMITIPORIA
- CUBENSIS Murrill. Old log in a field.
- FLAVOMARGINATA Murrill. Decayed hardwood logs in a forest.

FUSCOPORELLA
- CORUSCANS Murrill. Decayed hardwood logs in a forest.
- PALMICOLA (Berk. & Curt.) Murrill. Dead stipes of a prickly palm.

FUSCOPORIA
- FERRUGINOSA (Schrad.) Murrill. Dead hardwood.
- RUFITINCTA (Cooke) Murrill. Dead wood.

MELANOPORELLA
- CARBONACEA (Berk. & Curt.) Murrill. Dead trunks.

TINCTOPORIA
- AURANTIOTINGENS (Ellis & Macbr.) Murrill. Decayed hardwood logs.

Tribe 2. POLYPOREAE

CERRENELLA

FARINACEA (Fries) Murrill. Decaying branches of hardwood trees.

COLTRICIA

SPATHULATA (Hook.) Murrill. Dead wood, often on roots.

CORIOLELLUS

SEPIUM (Berk.) Murrill. Structural timber and other dead wood.

CORIOLOPSIS

CAPERATA (Berk.) Murrill. Dead wood.
CIRRIFER (Berk. & Curt.) Murrill. Dead logs.
CROCATA (Fries) Murrill. Dead hardwood logs.
FULVOCINEREA Murrill. Dead wood.
NIGROCINEREA Murrill. Dead wood.
OCCIDENTALIS (Klotsch) Murrill. Dead wood.
RIGIDA (Berk. & Mont.) Murrill. Dead wood.
SUBGLABRESCENS Murrill. Dead wood.
TAYLORI Murrill. Dead logs.
VIBRATILIS (Berk. & Curt.) Murrill. Dead wood.

CORIOLUS

ABIETINUS (Dicks.) Quél. Dead pine trunks.
ARMENICOLOR (Berk. & Curt.) Murrill. Dead wood.
BRACHYPUS (Lév.) Murrill. Dead wood.
DELECTANS Murrill. Dead hardwood trunk in a forest.
DEPAUPERATUS (Pat.) Murrill. Dead wood.
FULVO-UMBRINUS Murrill. Old timber near the beach.
HAEDINUS (Berk.) Pat. Dead wood.
MAXIMUS (Mont.) Murrill. Dead logs.
MEMBRANACEUS (Sw.) Pat. Dead wood.
NIGROMARGINATUS (Schw.) Murrill. Dead wood.
OCHROTINCTELLUS Murrill. Dead wood.
PALLIDOFULVELLUS Murrill. Dead wood.
PAVONIUS (Hook.) Murrill. Dead hardwood logs.
PINSITUS (Fries) Pat. Dead wood.
PROLIFICANS (Fries) Murrill. Dead wood.
SECTOR (Ehrenb.) Pat. Dead wood.
SERICEOHIRSUTUS (Klotsch) Murrill. Dead trunks of red cedar.
SOBRIUS (Berk. & Curt.) Murrill. Dead wood.
VERSICOLOR (L.) Quél. Dead wood.

CYCLOPORELLUS

IODINUS (Mont.) Murrill. Dead hardwood.

BJERKANDERA

ADUSTA (Willd.) P. Karst. Dead wood.
ALBOSTYGIA (Berk. & Curt.) Murrill. Dead wood.
SUBSIMULANS Murrill. Dead trunks.
TEREBRANS (Berk. & Curt.) Murrill. Dead trees.

EARLIELLA

CORRUGATA (Pers.) Murrill. Dead hardwood trunks.

FAVOLUS
TENUIS (Hook.) Murrill. Dead hardwood trunks and branches.
VARIEGATUS (Berk.) Murrill. Dead wood.
FLAVIPORELLUS
SPLITGERBERI (Mont.) Murrill. Dead wood.
FLAVIPORUS
CROCITINCTUS (Berk. & Curt.) Murrill. Dead wood.
RUFOFLAVUS (Berk. & Curt.) Murrill. Dead wood.
FUNALIA
ACULEIFER (Berk. & Curt.) Murrill. Dead wood.
CLADOTRICHA (Berk. & Curt.) Murrill. Dead wood.
HISPIDULA (Berk. & Curt.) Murrill. Dead wood.
VERSATILIS (Berk.) Murrill. Dead wood.
HAPALOPILUS
GILVUS (Schw.) Murrill. Dead wood.
LICNOIDES (Mont.) Murrill. Dead wood.
HEXAGONA
BRUNNEOLA (Berk. & Curt.) Murrill. Dead wood.
CUCULLATA (Mont.) Murrill. Dead wood.
DAEDALEA (Link) Murrill. Dead wood.
FRAGILIS Murrill. Dead wood.
PRINCEPS (Berk. & Curt.) Murrill. Dead wood.
PURPURASCENS (Berk. & Curt.) Murrill. Trunks of trees.
SUBCAPERATA Murrill. Decayed logs.
TESSELLATULA Murrill. Dead wood.
INONOTUS
CORROSUS Murrill. Dead trunks and vines.
FRUTICUM (Berk. & Curt.) Murrill. Living twigs of orange and oleander.
PERTENUIS Murrill. Dead wood.
IRPICIPORUS
CUBENSIS (Berk. & Curt.) Murrill. Dead wood.
LACTEUS (Fries) Murrill. Dead wood.
LAETIPORUS
SPECIOSUS (Batt.) Murrill. Living trunks of various trees.
MICROPORELLUS
DEALBATUS (Berk. & Curt.) Murrill. Dead wood.
HOLOTEPHRUS (Berk. & Curt.) Murrill. Dead wood.
PORPHYRITIS (Berk.) Murrill. Dead wood.
NIGROPORUS
VINOSUS (Berk.) Murrill. Dead wood.
PHAEOLUS
SISTOTREMOIDES (Alb. & Schw.) Murrill. Trunks, stumps, and roots of pine.
POGONOMYCES
HYDNOIDES (Sw.) Murrill. Dead wood.
POLYPORUS
ACICULA Berk. & Curt. Dead wood.
AEMULANS Berk. & Curt. Dead wood.
ARCULARIUS (Batsch.) Fries. Dead wood.
BLANCHETIANUS Berk. & Mont. Dead wood.

CYATHIFORMIS Lév. Dead logs.
DISCOIDEUS Berk. & Curt. Dead wood.
HYDNICEPS Berk. & Curt. Dead wood.
SCABRICEPS Berk. & Curt. Dead wood.
TRICHOLOMA Mont. Dead sticks and logs in woods.
TUBA Berk. & Curt. Dead wood.
VIRGATUS Berk. & Curt. Dead wood.
WRIGHTII Murrill. Dead wood.

PYCNOPORUS
SANGUINEUS (L.) Murrill. Dead wood.

RIGIDIPORUS
CONTRARIUS (Cooke) Murrill. Dead trunks.
EVOLUTUS (Berk. & Curt.) Murrill. Dead wood.
LIEBMANNI (Fries) Murrill. Dead wood.
MICROSTOMUS (Berk. & Curt.) Murrill. Dead wood.
SUBSTEREINUS Murrill. Dead sticks in woods.
SURINAMENSIS (Miq.) Murrill. Water-soaked hardwood trunks.

SPONGIPELLIS
HYDROPHILUS (Berk. & Curt.) Murrill. Dead logs.
SUBSTUPPEUS (Berk. & Cooke) Murrill. Dead wood.

SPONGIPORUS
ALTOCEDRONENSIS Murrill. Dead wood.

TRAMETES
CUBENSIS (Mont.) Sacc. Dead logs.
HAVANNENSIS (Berk. & Curt.) Murrill. Dead wood.
NIVOSA (Berk.) Murrill. Dead wood.
SUBMURINA Murrill. Old logs.

TRICHAPTUM
TRICHOMALLUM (Berk. & Mont.) Murrill. Dead logs.

TYROMYCES
ALBOGILVUS (Berk. & Curt.) Murrill. Dead trunks in woods.
FULVITINCTUS (Berk. & Curt.) Murrill. Dead wood.
LEUCOMALLUS (Berk. & Curt.) Murrill. Dead wood.
NIVOSELLUS Murrill. Dead palm trunks.
PALMARUM Murrill. Dead palm logs.
PALUSTRIS (Berk. & Curt.) Murrill. Pine trunks.
VERSICUTIS (Berk. & Curt.) Murrill. Dead wood.

Tribe 3. FOMITEAE

AMAURODERMA
CHAPERI (Pat.) Murrill. Dead wood.
REGULICOLOR (Cooke) Murrill. Decaying roots of hardwood trees.

ELFVINGIA
FASCIATA (Sw.) Murrill. Dead trunks of trees.
TORNATA (Pers.) Murrill. Decayed logs and stumps.

FOMES
AUBERIANUS (Mont.) Murrill. Dead or wounded hardwood trunks.
LIGNEUS (Berk.) Cooke. Dead wood.
SAGRAEANUS (Mont.) Murrill. Dead logs and stumps.

SUBFERREUS Murrill. Hardwood logs.
TURBINATUS (Pat.) Murrill. Decayed trunks and branches.
UNGULATUS (Schaeff.) Sacc. Pine trunks.

FOMITELLA
SUPINA (Sw.) Murrill. Dead wood.

FULVIFOMES
CALCITRATUS (Berk. & Curt.) Murrill. Dead wood.
DEPENDENS Murrill. Trunks of living hardwood trees.
EXTENSUS (Lév.) Murrill. Decayed trunks.
SUBPECTINATUS Murrill. Dead wood.
SWIETENIAE Murrill. Mahogany stumps.
UNDERWOODII Murrill. Dead wood.
YUCATANENSIS Murrill. Dead trunks and stumps.

GANODERMA
ARGILLACEUM Murrill. Dead trunks.
PERZONATUM Murrill. Mango logs.
PRAELONGUM Murrill. Dead wood.
PULVERULENTUM Murrill. Dead wood.
SUBINCRUSTATUM Murrill. Dead wood.
TUBERCULOSUM Murrill. Dead wood.

NIGROFOMES
MELANOPORUS (Mont.) Murrill. Dead or diseased trunks of trees.

PYROPOLYPORUS
ROSEOCINEREUS Murrill. Dead wood.

DOUBTFUL SPECIES OF FOMITEAE

Polyporus
sclerodes Berk. & Curt. Dead wood.
scleromyces Berk. & Curt. Dead wood.
subflexibilis Berk. & Curt.
Ptychogaster cubensis Pat. Base of trunks.

Tribe 4. DAEDALEAE

DAEDALEA
AMANITOIDES Beauv. Dead wood.
SPRUCEI Berk. Dead or living trunks.

GLOEOPHYLLUM
BERKELEYI (Sacc.) Murrill. Pine railway ties and other forms of dead coniferous wood.
STRIATUM (Sw.) Murrill. Dead wood.

LENZITES
CUBENSIS Berk. & Curt. Dead wood.

DOUBTFUL SPECIES OF DAEDALEAE

Daedalea violacea Lév.

AGARICACEAE

Hymenium plicate, the folds obtuse. — Tribe 1. CHANTERELEAE.
Hymenium truly lamellate.
  Context composed mostly of swollen, vesicular cells. — Tribe 2. LACTARIEAE.
  Context composed of slender, elongate cells. — Tribe 3. AGARICEAE.

Tribe 1. CHANTERELEAE

ASTEROPHORA
  CLAVUS (Schaeff.) Murrill. Decaying agarics.
PLICATURA
  LATERITIA (Berk. & Curt.) Murrill. Dead trunks and vines.
  OBLIQUA (Berk. & Curt.) Murrill. Dead wood.

Tribe 2. LACTARIEAE

No species of *Lactaria* or *Russula* are known from Cuba.

Tribe 3. AGARICEAE

Spores white in mass, rarely tinged or becoming tinged with yellow, green, violet, or brown. — Subtribe 1. LEPIOTANAE.
Spores rosy or rosy-ochraceous in mass. — Subtribe 2. PLUTEANAE.
Spores ochraceous, ferrugineous, or fulvous in mass. — Subtribe 3. PHOLIOTANAE.
Spores brown, purplish-brown, or black in mass. — Subtribe 4. AGARICANAE.

Subtribe 1. LEPIOTANAE

ARMILLARIA
  ALPHITOPHYLLA (Berk. & Curt.) Murrill. Exposed hardwood logs and decayed spots on standing trunks.
  PUTRIDA (Scop.) Murrill. Stumps and buried roots.
CREPIDOPUS
  CAVEATUS (Berk. & Curt.) Murrill. Dead standing trunks and logs.
  COMMISCIBILIS (Berk. & Curt.) Murrill. Logs in woods.
  EUGENIAE (Earle) Murrill. Dead trunks and roots of *Eugenia Jambos*.
  HEMIPHLEBIUS (Berk. & Curt.) Murrill. Dead wood.
CRINIPELLIS
  SCABELLA (Alb. & Schw.) Murrill. Dead stems, roots, and leaves.
  STUPPARIA (Berk. & Curt.) Pat. Dead sticks in woods.
GEOPETALUM
  COPULATUM (Ehrenb.) Murrill. Cocoanut petioles and other dead wood in shaded places.
  FLAVOLANATUM (Berk. & Curt.) Murrill. Fallen sticks.
  HAEDINUM (Berk. & Curt.) Murrill. Dead wood.
  SEMITECTUM (Berk. & Curt.) Murrill. Logs in dense woods.
  SUBELATINUM Murrill. Decayed wood.
GYMNOPUS
  BORYANUS (Mont.) Murrill. Dead trunks.
  CHRYSOPEPLUS (Berk. & Curt.) Murrill. Dead wood.
  MUSICOLA Murrill. Banana trash.

NIGRITA (Berk. & Curt.) Murrill. Dead wood.
TENUIPES (Schw.) Murrill. Dead wood.

HIATULA
PURPURASCENS Berk. & Curt. Decayed leaves.

HYDROCYBE
EARLEI Murrill. Ground in pasture.

HYGROPHORUS
SUBPRATENSIS Murrill. Banana trash and on lawns.

LACCARIA
LACCATA (Scop.) Berk. & Br. Ground in woods or open places.

LENTINULA
DETONSA (Fries) Murrill. Dead wood.

LENTINUS
CRINITUS (L.) Fries. Exposed logs and stumps.
GRAMINICOLA Murrill. Old grass roots.
HIRTUS (Fries) Murrill. Dead wood.
STRIGELLUS Berk. & Curt. Dead wood.
STRIGOSUS (Schw.) Fries. Old logs and stumps.
VELUTINUS Fries. Dead wood.

LENTODIELLUM
CONCAVUM (Berk.) Murrill. Dead logs and stumps.

LENTODIUM
SQUAMOSUM (Schaeff.) Murrill. Structural timbers and logs, especially of coniferous trees.

LEPIOTA
ABRUPTIBULBA Murrill. Ground in banana fields and thickets.
CRETACEA (Bull.) Morgan. Rich soil in cultivated grounds or woods.
FLAVODISCA Murrill. Bermuda grass sod.
HEMISCLERA (Berk. & Curt.) Sacc. Logs in woods.
LACTEA Murrill. Ground in banana fields.
LONGISTRIATA Peck. Soil in woods or cultivated grounds.
RIMOSA Murrill. Ground in gardens.
SUBCLYPEOLARIA (Berk. & Curt.) Sacc. Roots of trees or dead wood.

MARASMIELLUS
INCONSPICUUS Murrill. Dead sticks.
PURPUREUS (Berk. & Curt.) Murrill. Stumps in woods.

MARASMIUS
ACICULAEFORMIS Berk. & Curt. Sticks in woods.
ALBOFUSCUS Berk. & Curt. Logs in woods.
ATROVIRIDIS Berk. & Curt. Decayed wood in thickets.
BADIUS Berk. & Curt. Bark in moss.
CHRYSOCHAETES Berk. & Curt. Dead leaves.
CORACICOLOR Berk. & Curt. Logs in woods.
CORACIPES Berk. & Curt. Woods.
CRESCENTIAE Murrill. Decaying fruits of calabash.
CUBENSIS Berk. & Curt. Dead wood.
CYATHIFORMIS Berk. & Curt. Dead wood.
FIBROSIPES Berk. & Curt. Dead wood.
FLAVELLUS (Berk. & Curt.) Murrill. Sticks in woods.

GRAMINIS Murrill. Dead Bermuda grass on lawns.
GUYANENSIS Mont. Dead leaves.
HAEMATOCEPHALUS (Mont.) Berk. & Curt. Fallen decayed leaves and wood.
HEMILEUCUS (Berk. & Curt.) Murrill. Dead leaves and sticks.
HINNULEUS Berk. & Curt. Dead leaves.
INEQUALIS Berk. & Curt. Dead sticks.
MUSICOLA Murrill. Decaying banana trash.
PERSONATUS Berk. & Curt. Dead leaves.
PETIOLORUM Berk. & Curt. Leaf petioles and nerves.
PICIPES Murrill. Fallen leaves of rose-apple.
PROLETARIUS Berk. & Curt. Dead sticks.
PRUINOSULUS Murrill. Dead grass stems.
PURPURASCENS Berk. & Curt. Sticks in shady woods.
PUTREDINIS Berk. & Curt. Decayed wood in forests.
RUGULOSUS Berk. & Curt. Sticks and leaves in woods.
SERICIPES Berk. & Curt. Dead sticks in woods.
STENOPHYLLUS Mont. Banana trash and decayed stalks and logs.
STYLOBATES Berk. & Curt. Decayed wood.
SUBGLOBOSUS Berk. & Curt. Sticks in woods.
SULCATIPES Murrill. Fallen dead leaves.
SYNODICUS (Kuntze) Fries. Dead sticks, leaf-stalks, grass, etc.
TENEBARUM Berk. & Curt. Sticks in woods.
TORTIPES Berk. & Curt. Decayed wood.
UNDERWOODII Murrill. Cocoanut petioles.
VIRIDIFUSCUS Berk. & Curt. Dead sticks in mountains.

MELANOLEUCA

HOLOPORPHYRA (Berk. & Curt.) Murrill. Rotten logs in woods and rich soil in coffee plantations.

MICROMPHALE

BRUNNESCENS Earle. Dead wood among mosses.
FUSCIFRONS (Berk. & Curt.) Murrill. Dead wood.
SUBEXCAVATUM Murrill. Dead wood.

OMPHALINA

CHONDRIPES (Berk. & Curt.) Murrill. Dead wood or other decayed vegetable matter.
COCCINEA Murrill. Rotten wood.
EARLEI Murrill. Soil under weeds and bushes.
FLAVELLA (Berk. & Curt.) Murrill. Dead sticks in woods.
MINIATA Murrill. Rotten wood.

OMPHALOPSIS

CAMPANELLA (Batsch) Earle. Rotten coniferous wood.
CITRICOLOR (Berk. & Curt.) Murrill. Dead leaves.
EUSPEIREA (Berk. & Curt.) Murrill. Dead logs in woods.

PANELLUS

CANTHARELLOIDES (Mont.) Murrill. Dead wood.
EUGRAMMUS (Mont.) Murrill. Dead wood.
SUBCANTHARELLOIDES Murrill. Old roots.

PLEUROTOPSIS

ARACHNOIDEA (Berk. & Curt.) Murrill. Dead wood.

POLYMARASMIUS

MULTICEPS (Berk. & Curt.) Murrill. Dead logs in woods.

SARMENTOSUS (Berk.) Murrill. Dead wood and leaves.

PRUNULUS

CARBONICOLA Murrill. Burnt sticks.

RORIDULUS (Berk. & Curt.) Murrill. Rotten wood.

RESUPINATUS

CUBENSIS Murrill. Dead sticks.

SUBBARBATULUS Murrill. Dead logs.

SUBBARBATUS (Berk. & Curt.) Murrill. Dead logs.

SCHIZOPHYLLUS

ALNEUS (L.) Schroet. Dead wood.

SCYTINOTUS

CONCOLOR (Berk. & Curt.) Murrill. Dead sticks and leaves in woods.

HAEMATODES (Berk. & Curt.) Murrill. Dead sticks.

DOUBTFUL SPECIES OF LEPIOTANAE

Agaricus rubrotinctus Berk. & Curt. On earth in woods.

Lentinus glabratus Mont. Compare *Lentinula detonsa.*

Pocillaria reflexa Earle. Compare *Lentinus crinitus.*

Subtribe 2. PLUTEANAE

ECCILIA

CUBENSIS Murrill. Moist thickets.

EARLEI Murrill. Dead sticks.

LEPTONIELLA

EARLEI Murrill. Ground in woods.

HYPOPORPHYRA (Berk. & Curt.) Murrill. Woods.

NOLANEA

CUBENSIS Murrill. Fallen dead wood in coffee groves.

PLEUROPUS

EARLEI Murrill. Ground in banana fields.

PLUTEUS

AETHALUS (Berk. & Curt.) Sacc. Dead wood.

CERVINUS (Schaeff.) Quél. Dead wood.

EARLEI Murrill. Dead logs.

LAETIFRONS (Berk. & Curt.) Sacc. Dead wood.

NITENS Pat. Dead wood.

TEPHROSTICTUS (Berk. & Curt.) Sacc. Under side of old logs.

VOLVARIOPSIS

BAKERI Murrill. Dead banana stumps.

BOMBYCINA (Schaeff.) Murrill. Dead spots in living trunks, or dead logs.

CUBENSIS Murrill. Ground in banana fields.

EARLEI Murrill. Ground in banana fields.

Subtribe 3. PHOLIOTANAE

CREPIDOTUS

CACAOPHYLLUS (Berk. & Curt.) Sacc. Dead wood.

PYRRHUS (Berk. & Curt.) Sacc. Dead wood.

SUBSTIPITATUS Murrill. Fallen dead twigs.
SULCATUS Murrill. Fallen dead branches.

GALERULA

CRISPA (Longyear) Murrill. Manure or manured ground.
HYPNI (Batsch) Murrill. Among mosses or grasses in shaded places.
MARTIANA (Berk. & Curt.) Murrill. Dead wood.
TENERA (Schaeff.) Murrill. Lawns or pastures, rarely in woods.

GYMNOPILUS

AREOLATUS Murrill. Decaying stumps.
AUREOBRUNNEUS (Berk. & Curt.) Murrill. Dead logs and stumps.
CHRYSOPELLUS (Berk. & Curt.) Murrill. Dead wood.
CHRYSOTRICHOIDES Murrill. Dead cocoanut logs.
CHRYSOTRICHUS (Berk. & Curt.) Murrill. Dead logs in fields.
HELVOLICEPS (Berk. & Curt.) Murrill. Dead logs in woods.
HISPIDELLUS Murrill. Old logs.
PALMICOLA Murrill. Dead logs.
PENETRANS (Fries) Murrill. Dead pine wood.
PHOLIOTOIDES Murrill. Dead royal palm trunks.
SUBPENETRANS Murrill. Dead wood.
TENUIS Murrill. Dead wood.

HEBELOMA

CUBENSE Murrill. Soil in gardens.

HYPODENDRUM

SCOBIFER (Berk. & Curt.) Murrill. About roots of trees.

MYCENA

JALAPENSIS Murrill. Among chips in woods or on rotting grass in fields.

NAUCORIA

OINODES (Berk. & Curt.) Sacc. Dead wood.
SEMIORBICULARIS (Bull.) Quél. Open manured ground.
SUBPECTINATA Murrill. Dead logs.
UNDERWOODII Murrill. Dead wood.

PHOLIOTA

CUBENSIS Earle. Ground under buildings.
MUSAE (Earle) Murrill. Dead banana stalks.

Subtribe 4. AGARICANAE

AGARICUS

BAMBUSIGENUS Berk. & Curt. Dead bamboo roots.
CAMPESTER L. Manured cultivated ground.
EARLEI Murrill. Red soil in banana fields.
HORNEI Murrill. Soil in fields.
HERRADURENSIS Murrill. Soil in gardens.
OCHRACEIDISCUS Murrill. Red soil on ditch banks.
PRAEMAGNUS Murrill. Grass near manure heaps.
SHAFERI Murrill. Soil.

ATYLOSPORA

COPRINOCEPS (Berk. & Curt.) Murrill. Dead logs.
CUBENSIS Murrill. Ground along paths.
EUTHUGRAMMA (Berk. & Curt.) Murrill. Dead wood.

MUSAE (Earle) Murrill. Dead banana trees.
PLUMIGERA (Berk. & Curt.) Murrill. Dead sticks in woods.
ROYSTONIAE (Earle) Murrill. Dead royal palm logs.

CAMPANULARIUS
CAMPANULATUS (L.) Earle. Manure or manured ground.
SOLIDIPES (Peck) Murrill. Horse manure.

COPRINUS
CUBENSIS Berk. & Curt. Dead logs.
SPRAGUEI Berk. & Curt. Open ground.

DECONICA
BULLACEA (Bull.) Sacc. Horse manure.
SCATIGENA (Berk. & Curt.) Sacc. Horse manure.

DROSOPHILA
APPENDICULATA (Bull.) Quél. Stumps and buried wood.
ATRICASTANEA Murrill. Buried wood in banana fields.
BREVIPES Murrill. Red clay soil.
CAESPITOSA (Earle) Murrill. Base of stumps in open ground.
CAMPESTRIS (Earle) Murrill. Bermuda grass lawns.
FLOCCULOSA (Earle) Murrill. Red earth under buildings.
PALLIDISPORA Murrill. Soil in gardens.
TENUIS Murrill. Ground in woods.

MELANOTUS
FUMOSIFOLIUS Murrill. Dead banana leaves or dead logs.
MUSICOLA (Berk. & Curt.) Murrill. Dead plantain leaves.

PSATHYRELLA
CUBENSIS Murrill. Clay soil in banana fields.
EARLEI Murrill. Buried wood in banana fields.
MINUTULA (Schaeff.) Murrill. Decayed wood and soil rich in humus.
STEVENSONII Murrill. Rich exposed soil.

PSILOCYBE
DICHROMA (Berk. & Curt.) Sacc. Dead wood.
PALMIGENA (Berk. & Curt.) Sacc. Palm stumps in woods.
PLUTONIA (Berk. & Curt.) Sacc. Dead wood.

STROPHARIA
CAESPITOSA Murrill. Red clay soil under houses.
CUBENSIS Earle. Pastures and manured ground.
FLOCCOSA Earle. Ground in the open.

DOUBTFUL SPECIES OF AGARICANAE

Psilocybe subviridis (Berk. & Curt.) Sacc. Dead wood.

NEW YORK BOTANICAL GARDEN.

CHARLES HORTON PECK

STEWART H. BURNHAM

"Lift the veil of interception between your vision and the most lonely spot in the heart of the Adirondack wilderness on some fair day, and you may see a man examining a vine his sharp eye has dectected in the tangled undergrowth. The man's figure is sparse and lithe and a little stooped. His hair is partially gray, his eyes glow with delight. 'A new species!' he breathes half audibly. Charles H. Peck, state botanist, has added another specimen to his long list of the various members of the New York state flora, and it will soon be placed among his treasures in the state herbarium."

Again we will lift the veil and go back eighty-five years. Charles Horton Peck, son of Joel B. and Pamelia Horton Peck, of English descent, was born in the northeastern part of the town of Sand Lake, March 30, 1833. "Sand Lake, Rensselaer county, was just a few clearings less than an unbroken forest then." About 1794, "his great grandfather, Eleazer Peck, removed from Farmington, Conn., to Sand Lake, N. Y., being attracted there by the oak timber, from which were manufactured staves for the Albany market."

As soon as Dr. Peck was old enough to be of assistance in his father's sawmill, at the foot of Larnard hill, his schooldays were limited to the winter season. "The schoolhouse that provided shelter for the master and a few children from the nearest homes was built of logs. The seats were made of saw-log slabs turned flat side up."

Speaking of the abundance of passenger pigeons in Sand Lake when he was a boy, he remarked that they were fond of red and black elderberries and buckwheat. He recalled going one time with his grandfather, who enjoyed fishing and hunting, to catch pigeons with a net, using a decoy and working the net from a brush hut nearby. During the morning the pigeons came down,

but, on pulling the net, it broke on account of age and most of the birds got away. It was late afternoon before they succeeded in getting the pigeons to come around again. The net had been mended and they had gone without their dinner; but this time two dozen or more birds were captured.

Dr. Peck first went to the Cranberry marsh at Sand Lake with his father, when eight or ten years old, to pick large cranberries,

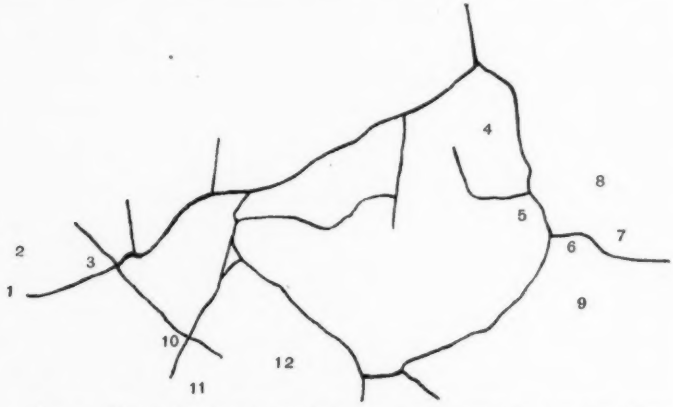

FIG. 1. Sketch showing the roads leading from Averill Park to Cranberry Marsh and the birthplace of Dr. Peck. 1, Averill Park, 800°; 2, Sand Lake; 3, Sand Lake Village; 4, Big Bowman Pond, 1500°; 5, Little Bowman Pond; 6, Birthplace of Dr. Peck; 7, Taberton; 8, Cranberry Marsh; 9, Larnard Hill, 1800°; 10, Glasshouse; 11, Glass Lake; 12, Bear's Head.

which were then abundant. The trail for a mile or so led through the dense forest. The marsh was very soft and quaking, but now it is growing firm from the cutting away of the forest, which causes a drying out of the soil so that less water reaches the marsh. It is mostly shaded by shrubs, tamaracks, spruces, and balsam firs. The large cranberry and the pitcher plant are now found only along the stream flowing through the marsh and in one or two wet, circular openings near the lower end. Sixty years ago the foreign population of Sand Lake and Berlin nearly eradicated the Sarracenia, upon learning from the Shakers that the roots had a medicinal value in the treatment of smallpox. About this time, also, the women and children dug goldthread

extensively from the mossy knolls under the spruces and balsams about the border of the swamp.

One could thrust a pole for eight or ten feet through the soft ooze in those days. The marsh was well known to the Indians, who came from the Hudson to gather cranberries; and Dr. Peck's great-grandmother once went with them and is said to have been the first white woman to visit the marsh. It lies about twelve hundred feet above the Hudson, in the northeastern part of the town of Sand Lake; a walk of five miles from Averill Park, and about three fourths of a mile from the German Hotel. One finds both black and red spruce on the marsh, although, according to Sargent, the latter species is confined to uplands. A list of the plants of Cranberry Marsh is given in the N. Y. State Mus. Bull. 150: 71–72. 1911.

In 1841, Dr. Peck made his first visit to Albany and ten years later he entered the State Normal School, which was located where the Christian Brothers Academy now stands, at the rear of Geological Hall. While at the Normal, he met a young lady at his boarding-house who was to take a class in botany and natural history in a city Jewish school, and desired some one to go to the woods and fields to hunt flowers for class study. By accident, the lot fell to Dr. Peck, who consented to go for her, and thereby awakened an interest in the subject which shaped and directed his whole future career. "Thus it often happens that apparently trifling circumstances give a color and character to the history of an individual which are far reaching in their influence and most important in their final results."

Dr. Peck was one of the first to join Prof. J. H. Salisbury's voluntary class in botany, taking it as an extra study, as it was not at that time included in the curriculum of the Normal School. Graduating from the Normal in 1852, on returning home, he was put to work in the hayfield, but all his spare time was spent in collecting and analyzing plants. During the winter of 1852–1853, he successfully taught a large district school, having an average attendance of about sixty pupils, in Poestenkill, Rensselaer County.

Dr. Peck now determined to prepare himself for a college course, and took his classical preparatory course at the Sand

Lake Collegiate Institute. He entered Union College in the fall of 1855, and received the degree of bachelor of arts in 1859. So high was his standing that he was one of three members of his class to be awarded the Nott Prize Scholarship, an honor given only to those who passed a special thorough and extended examination. While at Union, he received his botanical instruction from Prof. Jonathan Pearson; and, in place of athletics, he made botanical excursions. He was a member of the Phi Beta Kappa Literary Society of Union College.

Just before graduation, Dr. Peck accepted a position as teacher in classics, mathematics, and botany in the Sand Lake Collegiate Institute, which position he held for about three years. He married Mary Catherine Sliter, the daughter of Calvin and Anna Maria Sliter, of Snyders Corners, Rensselaer County, April 10, 1861. He had two sons: Harry Sliter, born 1863, and Charles Albert, born 1870. Mrs. Peck died February 26, 1912.

Soon after his marriage, he was one day putting a stick of wood in the stove and noticed a moss upon it. He became interested, and went to Brooklyn, where he met Prof. Alphonse Wood and was advised to get Sullivant's work on mosses, which appeared in the earlier editions of Gray's Manual. Equipped with the Manual and a $12.00 microscope, he returned home and began the study of bryology independent of a teacher or collection. He would search for the name of a moss for hours, if necessary, reading each description as he went along until he found the one that fitted his specimen.

Afterwards, while teaching in Albany, he presented his collection to the State; and it was there seen by Judge Geo. W. Clinton, of Buffalo, one of the regents, who was finally instrumental in securing Dr. Peck's appointment in the State Cabinet of Natural History. The "Catalogue of Mosses presented to the State of New York by Charles H. Peck" is published in Ann. Rep. State Cab. Nat. Hist, **18**: 193–194. 1865. He states that "of the 144 species named . . . 104 were found in the town of Sand Lake."

In 1862 he received the degree of master of arts from Union; and, in the same year, he was instructor in the classical department of the State Street High School at Albany, a private school for boys under the control and principalship of Levi Cass. Dr.

Peck would often relate how on Monday mornings, when the boys came in from their Sunday holiday unprepared in their lessons, instead of flogging them, he would take from his desk plants which he cherished and talk to the boys about them.

On the first of January, 1867, he was appointed by the State to fill the herbarium with specimens representing the plant life of the State. There were at that time about 1,800 specimens in the collections of the State Cabinet of Natural History; but, at the close of Dr. Peck's career, the herbarium of the State Museum contained many thousands of specimens, including thousands of priceless mycological collections.

Rev. Moses A. Curtis, of North Carolina, first gave Dr. Peck a start in the fungi, which was the beginning of the mycological collection of the State Herbarium—a collection, the gathering and study of which has given him a world-wide name for all time.

In 1868, Dr. Peck visited the Adirondacks and climbed Wallface without a guide. A very sudden, cold rainstorm came up, and on attempting to descend the mountain in the clouds, he fortunately came upon a camp well supplied with food and blankets and was thus saved from great peril. After this experience, he seldom attempted to climb the higher Adirondacks alone.

He visited North Elba a score or more times, and climbed Mt. Marcy eleven times, usually taking two days for the trip. This high peak "is in the center of a very rugged mountainous region, where high peaks separated by deep and narrow valleys rise on all sides. From its summit an observer may look in every direction, and obtain views unsurpassed in beauty and grandeur. A visit to this lofty station necessitates a tiresome walk of six or seven miles through the woods over a rough trail and up some steep acclivities. But the attraction of the place, the magnificent views it affords and the richness of its flora bring many visitors, and few return without feeling well rewarded for the labor and expense incurred." The reports of the Adirondack and State Land Survey, by Verplanck Colvin, 1880, 1891, contain preliminary lists of the plants of the summit of Mt. Marcy; and the N. Y. State Mus. Bull. **25**: 657–673. 1899, a more complete annotated list.

In 1883, a law was passed creating the office of State Botanist; and Dr. Peck was appointed by the Regents to fill the position.

At the 112th Commencement of Union College, June 10, 1908, in presenting Dr. Peck for his degree, Chairman Brownell said:

"By the direction of the Board of Trustees, I present for the degree of Doctor of Science, Charles Horton Peck of the Class of 1859. A graduate of this College, he has been for many years in public service as Botanist of the Empire State, Author, and Student of Nature and of Science. I request that the degree be conferred upon him."

President Alexander conferred the degree in the following words:

"Charles Horton Peck. For faithful labors and high attainments in the realm of Science and for long and fruitful service, by the authority committed to me by the Trustees of Union College I confer upon you the degree of Doctor of Science and bid you enjoy all the rights, privileges and immunities pertaining thereto."

Dr. Peck retired from his position of State Botanist early in 1915, after a period of forty-eight years of faithful, conscientious, and honest service. He died at his home in Menands, July 11, 1917; and was buried in the family plot in Sand Lake Cemetery near Averill Park.

Dr. Peck was the author of many botanical articles and reports, preëminent among which is the long series of annual reports of the State Botanist from 1867 to 1912. He was a Fellow of the American Association for the Advancement of Science; a member of the Botanical Society of America; of the Albany Historical and Art Society; American Forestry Association; National Geographic Society; New England Botanical Club; and many mycological and scientific societies; and was a devout member of the Presbyterian church for over sixty years.

"Dr. Peck has accomplished a great work. He has built a gigantic monument to himself by his long labor in the herbarium. He has wandered over every section of the State from the Adirondack wilds to the Montezuma marshes, and westward to the grape belt along the shores of Lake Erie."

"Without the advantages of European travel and study, and frequently working without access to the older European literature upon fungi, his work stands out with conspicuous individ-

uality." "Anyone who has ever strolled into the great open field of mycology will meet with his alluring guide posts; but to all who have studied the fungi his researches have been a genuine stimulation." "It is one of the lessons of his life that the practical pursuit of botany is contributing to long life and glad heartiness."

"His work will stand for all time as the foundation upon which later students of the fungi may build with safety a more elaborate morphological and systematic revision of the fleshy and woody groups of fungi."

HUDSON FALLS, N. Y.

NOTES AND BRIEF ARTICLES

Professor John Dearness, one of the editors of MYCOLOGIA, was recently appointed principal of the Normal School at London, Ontario, Canada.

Dr. V. H. Young, formerly assistant professor of botany at the State University of Iowa, is now head of the department of botany at the University of Idaho.

Professor G. F. Atkinson,* with Miss Gertrude Douglass and Miss Edwina Smiley as assistants, spent most of the past summer between Florida and Washington, D. C., collecting and photographing fleshy fungi. About the middle of September he left for the Pacific Coast to continue the work of exploration.

Dr. Charlotte Elliott, of Dell Rapids, South Dakota, has been appointed assistant pathologist in the Laboratory of Plant Pathology, Bureau of Plant Industry.

Mr. G. H. Martin, Jr., formerly a teaching fellow in plant pathology at the University of Washington, has accepted the position of plant pathologist in the Plant Disease Survey, Bureau of Plant Industry.

Dr. F. A. Wolf, for several years in charge of the botany and plant pathology work at the North Carolina Agricultural College and Experiment Station, has been given a commission as first lieutenant in the sanitary corps of the Army.

The rare *Venenarius glabriceps*, figured in MYCOLOGIA for September, 1916, was found again in the New York Botanical Garden, on September 14, by F. F. Wilmousky.

* News has just been received that Professor Atkinson died of pneumonia in a hospital in Tacoma about the middle of November. Details are not available.

Excellent young specimens of *Armillaria nobilis* were recently sent to the Garden herbarium in a collection of 13 species of Colorado fungi secured by Dr. Joseph Cuneo at 8,500 feet elevation near Denver, Colorado.

Specimens of *Daedalea quercina* were collected in September at East Nottingham, Pennsylvania, by Professor A. H. Graves on Japanese chestnut and on butternut. The usual hosts for this fungus are oak and chestnut, butternut being very unusual.

A splendid sugar maple standing near the Bedford Park entrance to the Garden had one of its large branches torn away from the trunk several years ago by a storm, leaving an ugly wound. The entire side of the trunk below the wound is now covered with fruit-bodies of *Cerrena unicolor,* while *Elfvingia megaloma* appeared the past summer at the base of the tree.

Mrs. Wallis Craig Smith sent to the Garden herbarium late in September, from Upper Jay, New York, several interesting specimens of fleshy fungi, among them *Melanoleuca equestris, Melanoleuca Russula, Phylloporus rhodoxanthus,* and several specimens of a species of *Cortinarius* with the lamellae extremely abnormal, resembling the hymenium of a Merulius and suggesting *Tremella mycetophila.*

A new journal, the *Annals of the Phytopathological Society of Japan,* has been launched under the managership of N. Suemastu, T. Hemmi, and U. Bokura. The first number contains a brief historical sketch of the development of plant pathology in Japan; several papers on plant diseases; and thirty pages of reviews of pathological literature and notes. We welcome this new journal and wish for it great prosperity.

A very large collection of fungi was brought in on September 24 from Scarsdale, New York, by Mrs. I. Martin and Mrs. L. M. Keeler. It contained, in addition to many other interesting species, a specimen of *Grifola Sumstinei.* On September 25, Mrs. Keeler collected in the same locality a cluster of *Clitocybe sub-*

connexa and presented it to the Garden herbarium. This species was first collected in the New York Botanical Garden and had been known only from the original collection.

Grifola Sumstinei Murrill was collected three times last autumn in the vicinity of New York City. A splendid museum specimen was first sent in from Ridgewood, New Jersey, by Mrs. Alexander Taylor; and it was afterwards found at Princess Bay, Staten Island, by Mr. F. F. Wilmousky, and at Scarsdale by Mrs. L. M. Keeler. This large tree-destroying polypore is intermediate between *Grifola Berkeleyi* and *Grifola frondosa,* and would probably be confused by some with the latter species, but its lobes are broader and soon become blackish, both above and below.

Psilocybe polycephala (Paulet) Peck was collected by W. A. Murrill in his yard near Bronx Park on September 27, 1918. It had appeared in the same spot three consecutive seasons, growing in the grass among *Clitocybe multiceps.* The clusters are very dense and the small caps are yellowish-brown and very hygrophanous, becoming pallid on drying. According to Peck, the species is edible; its taste is certainly very agreeable. The gills are so slow in changing color that it might easily be mistaken at first for a white-spored species.

An article of unusual interest by Shantz and Piemeisel on fungous fairy rings in eastern Colorado and their effect on vegetation appeared in Vol. XI of the *Journal of Agricultural Research,* the 56 pages of text being illustrated by 21 plates and 15 figures. The paper begins with a summary of past studies and a list of the fungi that have been reported to form rings. Some are said to be destructive to grass and other forms of vegetation and others are claimed to be beneficial by causing stimulation of growth. The annual enlargement, as well as the age, of the rings is discussed, and some of the very large rings are estimated to be from 400 to 600 years old!

The North American species of *Coniophora* were treated by Burt in the *Annals of the Missouri Botanical Garden* for Septem-

ber, 1917. Dr. Burt recognizes 19 species, 5 of which are described as new and 2 are newly combined. The 33 pages of text are illustrated by 19 text figures. New species are: *Coniophora inflata,* from Parral, Mexico, *Matthews; C. vaga,* from Hudson Falls, New York, *Burnham; C. avellanea,* from East Galway, New York, *Burt; C. Harperi,* from Lake Geneva, Wisconsin, *Harper;* and *C. flava,* from Troy and Tyre, Jamaica, *Murrill & Harris.* New combinations are: *Coniophora Kalmiae* (Peck) Burt, and *C. polyporoidea* (Berk. & Curt.) Burt. The following species are excluded: *Coniophora capnoides* Ellis & Ev., *C. sordulenta* Cooke & Massee, and *Hypochnus pallescens* (Schw.) Burt, comb. nov.

A paper on some edible and poisonous mushrooms, by Dr. W. B. McDougall, was published in the spring of 1918 (Bull. Ill. State Lab. Nat. Hist. **11**: 413–555. 1917). The treatment of the species included is excellent, while the 57 halftone plates leave little to be desired except color. Attention may be called to the following species said to be edible: *Stropharia epimyces, Hypholoma lachrymabundum, Clitocybe odora, Mycena galericulata, Galera tenera, Claudopus nidulans,* and *Boletinus porosus.* The peculiar odor of *Claudopus nidulans,* so characteristic and yet so difficult to describe, is said to resemble that of the freshly opened viscera of swine. The parasitic mold so common on *Lentinus tigrinus* is said to be due to a species of *Sporotrichum,* a discovery credited to Miss Esther Young.

Dr. E. W. Olive, of the Brooklyn Botanic Garden, spent some time during the past summer assisting government and state agents in locating plant diseases and instructing farmers how to combat them. His experiences in parts of New York and Virginia were given in a public lecture at the New York Botanical Garden on October 26, with lantern slides illustrating some of the most important and recently introduced diseases, among them the nematode disease of wheat noted in the November number of MYCOLOGIA and the potato wart disease referred to below.

The European potato wart disease has been discovered in ten mining villages near Hazelton, Pennsylvania, by Professor J. G. Sanders, economic zoologist of that state. Every effort of the

state authorities, with the federal department assisting, is being directed to prevent the further spread of this insidious and most dangerous disease known to affect the potato. It appears that the disease has been established in some of these villages for at least seven or eight years, where it has been impossible at times to secure even the amount of seed planted. It is deemed advisable that all state authorities should inspect large centers of consumption where imported potatoes may have been purchased during the past eight or ten years.

A comprehensive report on the sugarcane diseases of Porto Rico, by J. R. Johnston and J. A. Stevenson, containing 88 pages of text and 13 plates, recently appeared in the *Journal of the Agricultural Department of Porto Rico.* It is stated that sugarcane diseases have been present and serious since 1870, and that some now present several difficult problems. Fungi found chiefly on the roots and lower stalk include *Marasmius Sacchari, Himantia stellifera,* and *Odontia saccharicola,* all of which are more or less concerned in the so-called root disease. The principal stalk diseases include red rot, *Colletotrichum falcatum;* rind disease, *Melanconium Sacchari;* and a new disease, *Cytospora Sacchari,* which seriously threatens certain varieties.

A number of leaf diseases are of universal occurrence, though none appear to be seriously injurious. Descriptions are given of red spot of the leaf sheath, *Cercospora vaginae;* red rot of the leaf sheath, *Sclerotium Rolfsii;* eye spot, *Helminthosporium Sacchari;* ring spot, *Leptosphaeria Sacchari;* brown leaf spot, *Cercospora longipes;* red stripe; and wither tip. The only important disease of cane cuttings, which is that due to *Thielaviopsis paradoxa,* is readily prevented by dipping them in Bordeaux mixture.

A chlorotic disease occurring on the south coast is described in connection with control measures. Yellow stripe occurs in very limited areas. The new disease (as yet uncontrolled), which is characterized by a mottling of the leaves followed by a stalk canker, occurs in the western portion of the island, occasioning heavy losses.

The influence of the war on botany is discussed in *Science* for August 23, 1918, by Neil E. Stevens, who finds that the "most striking effect on American botanists has been to direct their attention more generally than ever before to the problems of plant pathology. . . . Statements that we 'must save wheat for our allies' lent new interest to the fact that stinking smut of wheat annually costs the United States twenty-two million bushels. Urgent advice that we must use perishable fruits and vegetables to save more concentrated foods for the armies in France called public attention sharply to the fact that fresh fruits and vegetables cannot easily be shipped great distances, that they are in truth highly perishable; and finally to the tragic fact that large amounts are annually lost in transit and on the market. . . . This summer is seeing a campaign for the control of plant diseases never approached in this country. With this there is being carried on an increased amount of research on fundamental scientific questions of significance in the control of plant diseases. . . . Undoubtedly the greatest immediate gain will come from the extension work, from the distribution of information to the plant pathologists of every state in the union and the further distribution of this information through the county agents and the farm demonstrators to the actual producers. It is highly probable, however, that the greatest ultimate good to plant pathology as a science and to the nation will come from the temporary enlistment of a large number of botanists from other lines."

Dr. Burt has done an excellent piece of work on the genus *Merulius* as represented in North America. His treatment was published in the *Annals of the Missouri Botanical Garden* for November, 1917, and comprises 58 pages of text, 38 text figures, and 3 plates containing 36 figures photographed natural size. There are 40 species recognized, 15 of which are new, 3 newly combined, and 2 doubtful and excluded. Most of the Garden collection was studied by Dr. Burt and 5 of his types are in the Garden herbarium.

New species: *Merulius hirsutus,* from Jalapa, Mexico, *Murrill; M. cubensis,* from Alto Cedro, Cuba, *Earle & Murrill; M. gyrosus,* from Vermilion, Michigan, *Povah; M. sororius,* from Ta-

koma Park, Maryland, *Shear; M. lichenicola,* from North Elba, New York, *Peck; M. dubius,* from New York City, *Murrill; M. sulphureus,* from Palm Beach, Florida, *Thaxter; M. tomentosus,* from Sidney, British Columbia, *Macoun; M. hirtellus,* from Sharon, Massachusetts, *Piquet; M. Farlowii,* from Chocorua, New Hampshire, *Farlow; M. americanus; M. hexagonoides,* from Muir Woods, California, *Harper; M. montanus,* from Priest River, Idaho, *Weir; M. byssoideus,* from Rio Piedras, Porto Rico, *Johnston;* and *M. atrovirens,* from Mt. Mitchell, North Carolina, *Atkinson.*

New combinations: *Merulius deglubens* (Berk. & Curt.) Burt, *M. terrestris* (Peck) Burt, and *M. pinastri* (Fries) Burt.

Doubtful and excluded species: *Merulius patellaeformis* Berk. & Curt. and *Poria incrassata* (Berk. & Curt.) Burt, comb. nov.

Merulius hirsutus was described by Dr. Burt from only a fragment of the original collection, owing to a delay in sending him the two large collections made near Jalapa, Mexico, one of which was accompanied by field notes and a colored sketch. In spite of this, the description as published leaves little to be desired. Dr. Murrill's field notes, however, are added below:

Pileus imbricate, sessile, projecting 1–4 cm., 3–5 cm. broad, about 3 mm. thick; surface cottony-white and densely tomentose, white on the margin; hymenium uneven and somewhat zonate-sulcate, ochraceous to ferruginous, consisting of very obtuse, low folds, which disappear near the margin.

On fallen dead branches in the forest.

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